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# MULTIMEDIA UNIVERSITY

## FINAL EXAMINATION

TRIMESTER 3, 2018/2019

### TTP 3121 – TCP/IP PROGRAMMING

(All Sections / Groups)

28 MAY 2019  
2.30 p.m. – 4.30 p.m.  
(2 Hours)

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#### INSTRUCTIONS TO STUDENTS

1. This Question paper consists of 4 printed pages including cover page with 5 questions only.
2. Attempt **ALL** questions. Marks and the distribution of marks for each question is given.
3. Please write all your answer in the Answer Booklet provided.

**Question 1 [10 Marks]**

- (a) Briefly explain **TWO** functionalities of the transport layer in TCP/IP Model.  
[2 Marks]
- (b) With aid of diagram, depict the three-way handshake of TCP connection.  
[4 Marks]
- (c) Using suitable diagrams, briefly explain **TWO** types of client server architecture.  
[4 Marks]

**Question 2 [10 Marks]**

- (a) Briefly outline **THREE** concepts of UNIX signal.  
[3 Marks]
- (b) Briefly explain the concept of fork () system call.  
[3 Marks]
- (c) Write a simple Python program to illustrate the fork () system call by printing process ID of the parent and child processes.  
[4 Marks]

**Question 3 [10 Marks]**

- (a) Explain **THREE** ways to share information between UNIX processes.  
[3 Marks]
- (b) Referring to Figure 1, answer the following:
  - i. Determine the operation and function of the program.
  - ii. Specify the outputs of the program.  
[1 + 2 = 3 Marks]

Continued ...

```
1  os
2
3  def communication(child_writes):
4
5      r, w = os.pipe()
6
7
8      processid = os.fork()
9      processid:
10
11
12      os.close(w)
13      r = os.fdopen(r)
14      print ("Parent reading")
15      str = r.read()
16      print( "Parent reads =", str)
17      :
18
19      os.close(r)
20      w = os.fdopen(w, 'w')
21      print ("Child writing")
22      w.write(child_writes)
23      print("Child writes = ", child_writes)
24      w.close()
25
26  child_writes = "Hello World"
27  communication(child_writes)
```

Figure 1

- (c) Write the programming steps to lock/unlock a semaphore.

[4 Marks]

**Question 4 [10 Marks]**

- (a) Briefly explain `setsockopt()` and `getsockname()` functions. [2 Marks]
- (b) Write simple echo server and echo client programs using TCP sockets whereby the server will simply echo whatever it receives back to the client. [7 Marks]
- (c) Outline the difference between the little-endian byte order and the big-endian byte order. [1 Mark]

**Question 5 [10 Marks]**

- (a) Outline **TWO** benefits of Remote Procedure Call (RPC). [2 Marks]
- (b) Explain **TWO** reasons why is the connectionless transport service more desirable for supporting RPCs. [2 Marks]
- (c) Write short notes on Blocking I/O model and Non-Blocking I/O model. [6 Marks]

**End of Paper**